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ORIGINAL ARTICLES.

A CASE OF UNILATERAL INTERSTITIAL KERATITIS DUE TO PAROTITIS.*

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Ocular diseases due to mumps seem to be sufficiently rare to make the following case worthy of record.

Mr. A., aged 32, consulted me April 2nd, 1913, giving the following history: Has just gotten well of a mild case of bilateral parotitis. About one week ago, when he was practically well of the mumps, his left eye became inflamed and his vision, which previously had been normal, became hazy. He has been using home remedies, but the vision has been gradually getting worse. General health good.

Present condition: Ciliary and conjunctival injection, photophobia and lacrimation. Cornea completely opaque, with the exception of about two mm. of the outer edge. V.=hand movements.

A diagnosis of interstitial keratitis, probably due to the mumps, was made. I prescribed hot applications, atropin and dionin locally, and bichloride of mercury internally. On April 28th, one week later, his vision was 13/30 and the inflammatory symptoms were rapidly disappearing. On May 5th the cornea was perfectly clear and vision normal. The atropin and dionin were discontinued and a 3 per cent. solution of boric acid prescribed, to be used three times daily. The bichloride was continued until May 16th, when all medication was stopped, as the eye was in a perfectly normal condition.

*Reported at the November meeting of the St. Louis Ophthalmological Society.

So far as I have observed, the literature on the subject refers to only three other cases of interstitial keratitis following mumps. One reported by Dr. J. W. Charles in 1906 (AMERICAN JOURNAL OF OPHTHALMOLOGY, July), one by Major H. Worthington (*Ophthalmology,* April, 1913), and one in Zossenheim-Deutschmann's *Beitr. für Augenheilkunde,* 4, Heft S. 58 (Ref. Michel's Jahresbericht, 1894).

Other diseases of the eye, caused by mumps, that have been reported are: neuro-retinitis, retro-bulbar neuritis, optic atrophy, iritis, dacryoadenitis, paralysis of accommodation, and paralysis of the extra-ocular muscles.

AN EYE WITH DOUBLE PERFORATION BY A FOREIGN BODY NOT LOCATED BY ROENTGEN RAYS.

HOLE IN THE FOVEA CENTRALIS. GIANT CELLS WITHIN THE LENS.

BY ADOLF ALT, M.D.,
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The eyeball, the interesting conditions of which I wish to describe in the following, was given to me by Dr. Wiener. The only facts of the history which he could give me were that the eyeball had been removed from a laborer at the Washington University Hospital of this city, on account of sympathetic irritation. The man's eye had been injured while at work a year or so before he called at the clinic on account of pain in the injured and blind eye and irritability of the other one, which seemed to incapacitate him for work. The injured eye showed a scar in the corneoscleral region on the temporal side, and the suspicion arose that there was a foreign body lodged within the eye. Yet, the plates prepared by a most competent Roentgen ray worker showed absolutely nothing. After the enucleation, too, no foreign body was found in the orbital tissues. When

I received the eyeball in formol solution I was somewhat astonished that it should appear so much like a normal eyeball, except for the scar in the corneoscleral tissue on the temporal side. After proper hardening I cut the eye in two by an equatorial section, and in so doing cut thick band of tissue in two which, passing through the vitreous body, was attached to the region of the scar on the one and to the sclerotic somewhat removed from the optic nerve papilla on the other side. The fluid vitreous body ran out. Its bacterial examination was negative.

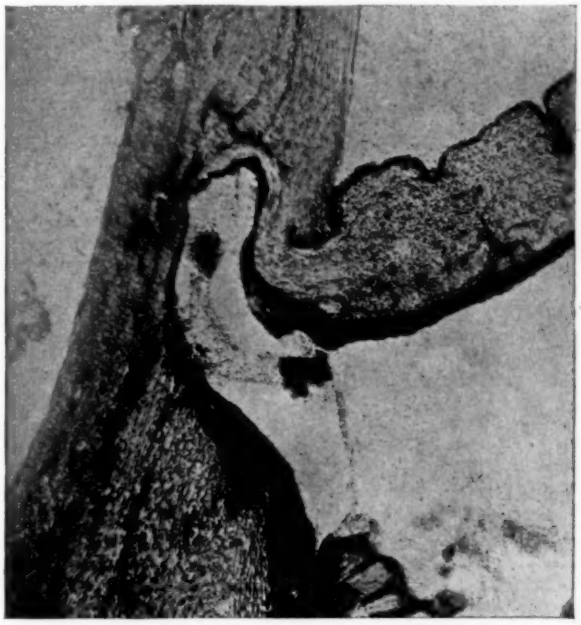

Fig. 1

As could be seen macroscopically, the penetrating foreign body had passed through the anterior part of the ciliary body, apparently without directly injuring the periphery of the iris, but it had evidently struck the posterior surface of the crystalline lens. From here, since the band of tissue probably marks its exact course, it had passed backwards in an oblique direction through the vitreous body, and out of the eyeball somewhat nasally to the optic papilla. This band of tissue was almost uniformly 1 mm. wide and about of the same thickness, tapering near its posterior insertion.

Besides the traumatic cataract formation, apparently restricted to the posterior periphery of the lens, there is a ciliary membrane forming a diaphragm behind the lens which consists of very loose tissue. The locality of the scar is but slightly indrawn, and on this side the retina back of the scar is somewhat detached. On the opposite side, the temporal one, the retina lies in the normal manner upon the choroid. The anterior chamber is, perhaps, a little deeper than normal and contains a coagulated exudate.

Microscopical examination showed the following interesting

Fig. 2

changes at the region of the scar. In sections in which the connective tissue band is enclosed it is plain that the penetrating foreign body has cut through the sclerotic and the ciliary body near its anterior third. The broad band of connective tissue is in direct connection with the scleral scar from which it has grown inward. The scar is firm and shows no cellular infiltration. In sections to either side of the scar there is a cystic enlargement, like an intercalary staphyloma, yet without ectasia outwards, lined with uveal pigment. To the anterior part of this the iris periphery is attached, while posteriorly the cystic en-

largement reaches nearly to the apex of the ciliary body. Since this intercalary staphyloma, if we may call it so, is not in connection with the firm scleral scar, we must, I think, assume that the impact of the foreign body when it penetrated the sclerotic caused an internal rupture of the corneoscleral tissue in the neighborhood of the penetrating wound. (See Fig. 1.)

The connective tissue band runs inward in an oblique direction, so that from the position in which I had embedded the specimen for microscopic sections, but few show a large part of it together with the scleral scar. Figure 2, however, shows the manner in which the connective tissue band on its way inwards divides the ciliary body into two portions. Here the cyclitic membrane with the characteristic cell tubules springing from the pars non plicata and some retinal tissue are attached to its posterior surface. The connective tissue band contains a great many bloodvessels, mostly surrounded by small round cell mantles, giving it in some sections the aspect of an angioma.

Following this tissue band backwards, it is seen to be attached to the sclerotic about 2 mm. nasally to the insertion of the dura mater sheath of the optic nerve. The sclerotical scar is as firm here as is the one in the anterior part of the eye and shows very little cellular infiltration. By the contraction of the connective tissue band the retina around its posterior insertion has been slightly detached and drawn inwards in a fold.

The condition of the two scleral scars is such that from their firmness and want of infiltration, it seems that they were perfectly healed a long time ago and that the present inflammatory condition of the interior of the eyeball is of recent date.

This recent inflammatory condition concerns especially the uveal tract. The iris, though hyperæmic and swollen, is but little infiltrated with small lymphoid cells. The ciliary body near the old scar is in patches densely infiltrated at its inner surface, and the cells have broken through the uveal pigment, in the manner designated by Fuchs as characteristic of an eye which is likely to produce sympathetic disease in its fellow. The outer layers are widely separated from each other by a fibrinous exudate containing some lymph cells. Farther back, as far as the posterior insertion of the connective tissue band, there is in patches a very dense infiltration especially in the outer layers of the very hyperæmic choroid. The ciliary vessels on the posterior surface of the eyeball, as far as present in the

specimen, too, are surrounded by a dense mantle of lymphoid cells. The optic papilla is flat and the nerve is atrophic and greatly infiltrated, not only in its interstitial tissue, but also around the central bloodvessels.

The retina, except at the side of the two injuries, is strangely well preserved, even the rods and cones appearing normal. The nerve fibre layer, however, is infiltrated with small round cells throughout; round cells in large numbers surround almost every bloodvessel. The most marked changes concern the region of the macula lutea. Here the retina is to some extent lifted from the choroid by a small quantity of fluid, which takes the eosin stain, as if it had been at some time charged with blood. The cones are destroyed and the tissue of the retina is highly

Fig. 3

œdematous, especially in its outer layers. Just at the fovea centralis a microscopic rupture has occurred, through which the cells of the inner layers are being washed into the vitreous body. The condition is so exactly like the one I described in the April, 1913, number of this Journal, page 102 and ssq, in another injured eye, that a photograph of this specimen would only be a repetition of the other.

The coagulated exudate in the anterior chamber, as well as the parts of vitreous body adhering to the cyclitic membrane and the anterior attachment of the band of connective tissue, contain a great many polymorphonuclear leukocytes.

Another interesting point is the condition of the crystalline lens. As stated above, the foreign body tore the posterior lens capsule near its periphery. Here a dense small round cell infiltration mixed with some polymorphonuclear leukocytes has replaced the lens tissue, of which only here and there a necrotic piece can be recognized lying between the round cells. A considerable number of giant cells have been formed here and probably must

Fig. 4

be looked upon as so-called foreign body giant cells. (See Fig. 3.)

On the anterior surface of the lens a broad posterior synechia has given rise to an anterior polar cataract. The anterior cortex, like what is left of the posterior one, also, shows cataract formation in the shape of large vesicular cells, although the anterior capsular epithelium, except in the localities mentioned, is very well preserved. Even here in the anterior cortex in a number of the sections one or two giant cells are encountered. The nucleus appears almost normal. (See Fig. 4.)

A number of cases have been reported in which foreign bodies were found within the eyeball, although they had not been detected by means of the Roentgen rays. In our case it is

certainly astonishing that this also occurred, as the foreign body must have been of considerable size and hardness. To be sure, after having penetrated the sclerotic posteriorly it must have made its way further back into the orbital tissue, and there is no telling just how far it went. Neither is it known of what nature it was.

From the histological findings it was undoubtedly wise to enucleate this eye, as it plainly shows the characteristics which made it dangerous to its fellow.

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TRANSLATIONS.

THE INTER-RELATION OF PATHOLOGICAL CONDITIONS OF THE CAVITIES IN THE NEIGHBORHOOD OF THE EYE AND NOSE VIEWED FROM THE OPHTHALMOLOGICAL STANDPOINT.*

By Dr. Julius Fejer.

(Translated by A. Alt, M.D.)

Since DeLapersonne, Berger, Kuhnt and Onodi have discovered in numerous anatomical specimens the relation of the accessory sinuses to the optic nerve and to the wall of the orbit, as well as their inter-relation between each other, and have studied many variations in these relations and have collected these cases, the teaching of the diseases of the accessory sinuses and their relation to the optic nerve has become the common good of rhinologists and oculists, and in consequence of such studies numerous patients have been saved from blindness by a prompt operation.

The study and exact observation of the diseases of the accessory sinuses may serve as an interesting example of how great an importance it is when the specialists of neighboring organs act together in order to determine their co-related pathological conditions on a scientific, anatomic and clinical basis.

In the observation of the cases the rhinologists have played the leading role, while oculists have but rarely spoken. I think, therefore, that I can be of some service by reviewing from the ophthalmological standpoint everything which is of importance for the practitioner in order to judge these cases, and especially to find the indications for an operation, correctly and at the right time. I shall illustrate these points by a few clinical observations of my own.

I cannot mention here all the points where the eye and its accessory organs (as I call the lacrimal apparatus) come into relation with disease of the nose and accessory sinuses. I intend rather to speak only of those diseases of the eye and accessory sinuses which influence vision, that is, the optic nerve or chiasma, indirectly or by a collateral route. From a clinical standpoint only that neighborhood is of importance which exists under

*Berliner Klin. Wochenschr., December 8th, 1913.

normal and pathologic anatomical conditions, on the one side between the sphenoid cavity and the posterior ethmoid cells, and on the other side between the optic nerve and chiasma. The exhausting and complete anatomical studies of Onodi have recently brought this question into the foreground and keep the interest attaching to it alive.

It had been stated that the medial wall of the canalis opticus is formed by the wall of the sphenoid cavity of the same side; but Onodi has shown that there are many irregularities at that point, and that not only the sphenoid cavity but, also, a posterior ethmoid cell can enter into a close neighborhood relation with the optic nerve; that the sphenoid cavity can participate in the formation of the wall of both canales optici, and that an ethmoid cell on one side and a sphenoid cavity on the other side may form its limits. It is impossible, and it is not my object here to enumerate all the possible interesting variations, based on anatomical examinations, and I have to refer you to Onodi's monograph on "The optic nerve and the accessory sinuses of the nose." I just want in short to direct your attention to the immediate neighborhood of the sphenoidal cavities, that is, of the sphenoid cavity and the posterior ethmoid cells with the optic nerve.

The patients come to the oculist with visual troubles. These may be of lower or higher degree, from scintillation, misty, cloudy vision to total blindness. The process is usually one-sided. Affections or even blindness of both eyes are extremely rare. The affection of the second eye takes place later only. One-sided reduction in vision always leads to the suspicion of a nasal origin. The subjective complaint of the patient, the rapid loss of vision both for near and far, is especially important for the right diagnosis. Another important aid is the examination of the central color sense, since in these cases a relative central scotoma for red and green is found even at a period when central vision is hardly disturbed and ophthalmoscopic changes cannot be found. In other cases the colors can still be recognized, but there is a so-called paracentral scotoma around the centre, and in this part the colors are not recognized and vision is very defective. Recently much importance has been given to the examination of the blind spot, and van der Hoeve and Kleijn maintain that the increase in size of the blind spot precedes the development of the central color scotoma and already exists as a pathological symptom when the colors are still

well recognized in the centre. These authors in examining such suppurations of the sphenoid cavities and ethmoid cells which were not complicated with eye affections have found that the enlargement of the blind spot affected not only the colors but in every case white, too. I unfortunately have no experiences regarding this point.

All symptoms above mentioned are explained by the fact that the papillo-macular bundle, which serves the innervation of the region between papilla and macula, is of all optic nerve fibres the most sensitive to any noxious influence or poison; and if the smallest disturbances in circulation, stasis, or collateral œdema occur in the neighborhood, this is enough to produce circulatory disturbances in this bundle, too. The first symptom of such disturbance of nutrition is the enlargement of the blind spot or the failure to recognize colors.

As regards the ophthalmoscopically visible changes in the fundus, they are extremely varying. Very frequently nothing abnormal is found. In other cases the edges of the papilla are indistinct, the surface is hazy, the veins are congested and slightly tortuous. Complete choked disc is rare. It may happen that the inflammation or the collateral œdema spreads into the retrobulbar connective tissue and causes exophthalmus, chemosis of the conjunctiva and œdema of the lids. I have even seen a case in which the retrobulbar phlegmone was very great and in which the inflammation spread by way of the veins into the cavernous sinus, causing thrombosis, thrombophlebitis and death.

I shall describe a case of each group from my practice.

De Lapersonne insists that a one-sided neuritic choked disc is always suspicious of rhinogenous origin; since, however, Onodi has shown that the conditions are extremely variable, and that both optic nerves may be in connection with the wall of the sphenoid cavity or the ethmoid cell, too much importance cannot be given to whether the affection is monolateral or bilateral. We must not forget how different the bony wall may be in thickness; it differs between the thickness of paper and 2 to 3 mm. This explains why not every case of accessory sinus suppuration must lead to inflammation of the optic nerve. Now let us come to my cases.

(1.) A 28 years old girl came on November 5th, 1910, on account of visual troubles in both eyes. The patient knows that they are of rhinogenous origin, because she has been operated repeatedly in her nose. She is now very much afraid because the

left eye is very hazy. R. E., V.=fingers at 20 cmm., but uncertain; L. E., V.=5/15. Glasses do not improve. Fundi normal, not even the bloodvessels differ from the norm. Visual field and color sense of the R. E. cannot be examined on account of the poor vision. The L. E. recognizes red and green promptly in the centre, but around the centre in an area of 10 degrees in a horizontal oval there is a paracentral relative scotoma for red and green. The field for white is reduced to 50 degrees upwards, 30 degrees downwards, 70 degrees outwards, and 60 degrees inwards. Having found out that the operator in spite of repeated operations had had no success and had not relieved the collateral pressure on the optic nerve, and since now both optic nerves were in great danger, I advised the patient to consult another specialist. He made several operations and opened up the ethmoid cells and sphenoid cavity widely. When the girl returned to me after 3 weeks, V. R. E.=5/30, and L. E.=5/15. and the haziness was almost completely gone. Central color vision was, however, still poor. On January 1st, 1911, V. R. E. was 5/10 and with correction 5/7; central color perception was good, but both papillæ were slightly decolorized. On May 15th, 1911, vision and papillæ were the same; the patient complained only that her eyes tired very easily. Lately I have seen the patient again and found the condition of the eyes satisfactory.

From the oculists' standpoint this case is of special interest, because in spite of the great loss of vision no changes were visible in the fundi, because both optici were affected in rapid sequence, and because, finally, after the healing of the suppuration in the accessory sinuses, still good and almost perfect vision was retained, with slight decolorization of the papillæ. It is, further on, a proof that circulatory disturbances in the optic nerve or its surroundings can produce loss of vision and a color scotoma, even when no pathological changes can be seen with the ophthalmoscope. The moderate decolorization of the papillæ proves that a pathological process must have taken place within the sheath or between the fibres of the optic nerve.

(2.) Although I have demonstrated this case before, it is here again referred to because it was not fully recognized from an ophthalmological standpoint.

The patient was a man 29 years old, who, when 21 years old, had acquired lues, which caused a necrotic process in the nose. He presented himself with total blindness of the right eye, haziness in the left and severe headaches. In spite of the blindness

of the right eye, I found the fundus normal in both, but in the left eye there was a relative central color scotoma. Shortly after a choked disc developed in both eyes, in the right with beginning decolorization. V. L. E. fell to 1/70. Dr. L. Lamb removed large masses of granulation tissue and necrotic bone, opened up the sphenoid cavity, ethmoid cells and antrum and washed them out carefully. By long continued treatment, cleaning out and scraping of the accessory sinuses, the suppuration was stopped and V. L. E. rose to 5/70; he recognized colors and the sense of smell returned. A week later V.=5/20; on the 12th day V.= 5/10; later 5/5 with normal visual field. The color scotoma disappeared as well as all symptoms of papillitis. The atrophy of the right papilla remained unchanged. Of late the patient had used mercurial inunctions and took iodide of potassium.

In this case we had to deal with a luetic suppuration of all accessory sinuses, complicated with a mucocele of the posterior ethmoid cells, which for a long time exerted a pressure on the optic nerve and caused a papillitis. I am firmly convinced that it would have been possible to save vision in the right eye, too, had the patient been seen at the right time, when it was still possible to free the optic nerve from the pressure due to the circulatory disturbance.

Let us look at this case more closely from the oculist's standpoint. In the first place, it is clear that the collateral œdema due to the suppuration in the posterior ethmoid cells and in the sphenoid cavity compressed both optic nerves and thus destroyed the right optic nerve altogether. The blindness of the right eye occurred at a time when no pathological changes could be seen in the fundus, and only the central color scotoma pointed to it that the cause of the optic nerve disease must be sought in the accessory sinuses. The appearance of the bilateral papillitis, the rapid loss of vision in the left eye and after the removal of the pressure, the equally rapid improvement, the return of color perception and enlargement of the visual field—all this shows that the rapid, complete and untiring rhino-chirurgical encheiresis and treatment saved the patient from complete blindness and rendered him again able to work. I have seen the patient repeatedly since and found him in good condition.

(3.) In the third one of my cases the suppuration of the accessory sinuses spread into the retrobulbar connective tissue and there caused an inflammation. On March 24th, 1912, I was called to see the patient, a man 30 years of age. He stated that

three days previously he was taken with severe fever and chills, and that on account of severe pain he had to have a molar tooth from the left side removed by a dentist. The temperature was 39.8 degrees C. and did not decrease materially after the tooth was removed. However, his left eyelid became swollen; there was exophthalmus and patient saw poorly. At the first examination I found a high grade œdema of the lids, exophthalmus, moderate venous stasis of the plica semilunaris and the fornix, and venous stasis in the retina. On account of the œdema of the lids his visual acuity could not be tested, but I could make out that there was no central color scotoma. My first idea was that the cause for this one-sided exophthalmus and the beginning retrobulbar inflammation must be sought for in the accessory sinuses and that this was probably connected with the pulling of the tooth, although the wound in the superior maxilla was perfectly clean and had already begun to heal. Examining the nose and the accessory sinuses with Roentgen rays we could see that the left antrum of Highmore and the left potserior ethmoid cells were diseased. The next day the operation was performed by Dr. Lamb. He opened up the nose, the dental cavity, the antrum and the ethmoid cells. The patient, however, improved but slowly and gradually, after several operations and repeated washing out of the different cavities. The fever grew less, the headache disappeared, as also the exophthalmus and the œdema of the lids. The lateral dislocation combined with the exophthalmus was so great that on April 8th the patient complained of diplopia, and the exophthalmus and the other symptoms did not begin to disappear till April 10th. On the 17th of April, V.= 5/5, patient read the finest print, the retinal veins were normal.

I would like to add to this that it was very interesting to see that it was possible by the prompt and correct endonasal operation to save the life and vision of a patient who had suffered for 8 days from fever and a high grade retrobulbar inflammation. How the infection took place, whether it was due to the tooth pulling, or whether the tooth was painful because there was already a suppuration in Highmore's antrum, we cannot state. The latter view is the more probable because there were chills before the tooth was pulled. The patient wanted to sue the dentist for damages, but gave it up on account of our view of the case.

(4.) Accessory sinus suppuration in connection with the teeth does, however, not always end so fortunately.

On February 29th, 1912, Guttman reported at the meeting of the Berlin Ophthalmic Society three cases in which tooth pulling was followed by orbital inflammation. Two of these died and the third suffered from neuritic optic nerve atrophy.

During the discussion Greef, too, reported the case of a child in which inflammatory exophthalmus followed the pulling of a tooth. The child died in spite of the proper operation.

Seligsohn related the case of a patient 40 years old in which the pulling of a tooth was followed by fever and exophthalmus, and death ensued after four days.

I may state that in these five cases dentists without medical training did the pulling and that the authors saw the cause of the infection in imperfect asepsis. It seems that such infections are not so very rare since at one scientific meeting five cases could be reported.

Four years ago I had a similar case, and I have published it under the title "On thrombosis of the cavernous sinus." I shall repeat it here in short.

The 26 years old patient consulted her family physician on account of toothache and swelling of the left half of the face. He found no carious tooth, but had one extracted which was suspicious of suppuration and painful. This was followed by fever and the œdema spread from the left outer canthus into the upper lid. When the nose was examined pus was found in the posterior ethmoid cells. Several incisions were made and a small particle of necrotic bone was removed. In spite of this the œdema increased, spread into the deeper tissues of the lid and became pasty; chemosis and exophthalmus followed. The patient could no longer move the eyeball. The fever rose to 40 degrees C. I saw the patient first in this condition, when the affection was eight days old. The pasty swelling of the lids, the chemosis, the exophthalmus, the choked disk, the œdema of the retina, the apathetic, feverish condition of the patient—all these symptoms pointed to the diagnosis of thrombosis of the cavernous sinus. Yet, it was not bilateral. However, since the endonasal operation was without success and apparently a fluctuation could be felt in the region of the frontal sinus, we decided to have this sinus and the posterior ethmoid cells opened from without by a surgeon. There was, however, no pus to be found and the patient died a few hours later under the symptoms of meningitis.

I feel like maintaining that pus in the ethmoid cells or in the

sphenoid cavity caused the thrombophlebitis of the cavernous sinus; and it seems to me to be very probable that by an endonasal operation made at the right time, that is by a broad opening and cleaning out of the posterior ethmoid cells and of the sphenoid cavity, the patient's life might have been saved. It is several years since I have seen this case when an early endonasal operation was not yet considered as important and necessary, as it is now, and when the technique of this operation was not yet as well developed. At that time, too, less weight was given to the eye symptoms and their great value was not well enough recognized. The external operation was decidedly made too late and therefore was unsuccessful.

I have chosen these four cases as paradigmata in order to demonstrate how much can be done by an early diagnosis and an early appropriate endonasal operation. When I review all my cases of papillitis, retrobulbar neuritis, amblyopia without ophthalmoscopic signs, which, on account of their being unilateral and uncertain as to their ætiology, I have referred to the rhinologist, I must state that there are not a great many among them in which the endonasal operation was followed by astonishing results. The cause of this lack of success probably lies in the incompleteness of our diagnostic faculty. It happens very often that the rhinologist does not find anything pathological in the nose or the accessory cavities, and yet there is no explanation for the local unilateral affection and no systemic disease can be made out. In such cases I can only recommend an explorative opening of the posterior ethmoid cells and the sphenoid cavity, even if an endonasal indication is wanting—as Birch-Hirschfeld and Paunz have advised. It is said that this operation is devoid of danger, although contrary observations may be found in literature. The cases of Laas and Schmidt-Rimpler are well known, in which after an endonasal bone operation, when the spina and septum was chiseled off, a sudden blindness and later on atrophy of the optic nerve resulted, probably because the bone fissure reached into the optic canal. When the ethmoid cells are opened an emphysema of the orbit or a hæmorrhage into the retrobulbar connective tissue not infrequently results.

The main point, however, in all operations on the accessory sinuses, the ethmoid cells and the sphenoid cavity is that the operation be a radical one, for, if only one single ethmoid pus containing cell remains unopened, the danger to the eye, even to the life of the patient, remains. Therefore, nobody must handle

these cases who does not possess the necessary anatomical knowledge and sound judgment.

It has several times been urged, and the question has been vividly discussed, that oculists should make themselves acquainted with the surgery of the nose and the accessory sinuses and themselves operate on their cases. Personally, I do not like supporting such an enlarging of our specialty in this direction, not because we could not learn the art of endonasal operations, but because these affections are comparatively rare and our practice would hardly furnish us so many cases that every one of us could acquire the necessary dexterity. Why should we appropriate a field, the anatomy, pathology and surgical technique of which has been worked out so excellently well by the rhinologists?

On the contrary, I agree with Bruckner, that solely the cooperation of ophthalmologists and rhinologists can lead to the ideal end, to guide the therapy correctly and if necessary to perform the operation at the right time.

I should like to suggest the following advice to the general practitioners regarding the making of a correct diagnosis.

In every case of one-sided diminution of vision, haziness and mistiness, in all cases of the one-sided appearance of grayish-black spots in the visual field with absence of any inflammatory symptoms on the eyeball, the suspicion of a local cause is highly justified. The examination of the central color sense brings the definite proof. When the patient cannot recognize the color of red or green wool held before his eye, there is a relative central color scotoma. The visual field for white must, however, also be examined. The diminution of central vision, eventually the congestion of the retinal veins, as also their tortuosity, the indistinctness of the margins of the papilla, neuritis or choked disk—all these symptoms prove that the circulation of the blood of lymph in the optic nerve is interfered with, that there is stasis. In such cases the examination of the nose and the accessory sinuses is imperative and a rhinologist must be consulted. Of course, all possible methods of examination must be exhausted, especially electric diaphanoscopy and Roentgen rays. Especially the latter show quite well which of the accessory sinuses are free and which are filled with pus or serous exudation. The shadows shown in the Roentgen plates will always explain the origin of the affection. The general clinical examination of the patient must of course, be made also; the con-

dition of his nervous apparatus, the urine and blood must be enquired into. We must never forget that the eye is the manometer of the brain and that by far the largest number of changes in the fundus point to the fact that something is wrong with the nervous system.

I conclude with the words of Onodi: "I am firmly convinced that the completion of this doctrine by means of clinical observations and as far as possible of necroscopic examinations, will be accomplished, and that the combined studies of the rhinologist and oculist will successfully finish this important and interesting chapter of medicine."

This prophecy of Onodi's made years ago has been fulfilled. The doctrine and the recognition of the corelation of diseases of the nose and accessory sinuses on the one hand, and of the eyes on the other hand, has become a common good to oculists and rhinologists.

ON THE RESULTS WITH EPERON'S ABORTIVE TREATMENT OF INFECTIOUS CORNEAL AFFECTIONS.*

By O. Purtscher.

(Translated by A. Alt, M.D.)

About a year ago Dr. Leonhardt, of Landshert, when passing through here drew my attention to a new abortive treatment or cure of infectious corneal ulcers which I had hitherto not known and with which he had had excellent results, namely the touching of the diseased parts with 20 per cent. solution of sulphate of zinc.

Professor Epéron has learned the efficacy of this method by accident and has used it ever since. Once when intending to touch an infectious ulcer of the cornea with a 20 per cent. solution of zinc chloride, he had through the error of the druggist received zinc sulphate. The result was, however, so satisfactory that later on he published his experiences with it in the French Archives d'Ophtalmologie (Vol. XXVII., July, 1907), and it is probably on this account that his method has thus far not become better known.

*Centralbl. f. p. Augenhlk., December, 1913.

At Dufour's clinic at Lausanne it has also been used, as Professor G. Gutmann, of Berlin, informed me after a visit to this clinic.

About a year ago I, too, began to treat all infectious corneal ulcers according to Epéron's method and can say that I have in general had very encouraging results with it.

After cocain had been instilled once or twice the application was made by touching the diseased part of the cornea quite energetically with a probe armed with some cotton; sometimes the probe even remained for a moment lying on the cornea. (The cocainization was made solely in order to be able to treat the cornea readily; there was no possibility to subdue the pain caused by the treatment).

When the ulcer was small and the view not disturbed by a hypopyon lying behind it, after the application the neighboring parts were seen to be covered with a delicate translucent bluish eschara.

The application was immediately followed by continued pain, which in general was easily borne and but exceptionally disturbed the night's rest. On the contrary, we observed often that patients who had been unable to sleep the night before, on account of pain, enjoyed an undisturbed night's rest, even if they had been treated in the afternoon.

In the successful cases the process was usually aborted with one single touching, and the eye became quiet in a few days. There were, however, other cases in which the touching exerted no influence whatever on the disease and, in order to lose no time, we were forced to use galvano-cautery.

Of course, we did not neglect all of the other well tried and proven means.

Thus, in all cases complicated with inflammations of the lacrimal sac the sac was removed, the next following day at the latest. Yet, in other cases which for obvious reasons had to be treated in the clinic and in which an operation was refused, we saw the ulcer heal in spite of the presence of this dangerous complication.

The local treatment further included copious washings with 1 to 3,000 bichloride of mercury solution and instillations of atropin, scopolamin, besides iodoform or collargol ointment.

Up to November 20th, 1913, we treated in the hospital 60 cases of infectious corneal ulcers according to Epéron's method. Of these 9 were serpiginous ulcers with affection of the lacrimal

sac, 12 were traumatic infectious ulcers, 25 so-called spontaneous corneal ulcers, and 7 ulcerous corneal processes of various kinds.

Since we treated every infectious corneal process even when progressed to the farthest stage with this remedy, the average time at the hospital could not be very much diminished.

Thus in the cases of serpiginous ulcer with tear sac affection the average period was 21 days; the shortest was 7, the longest 28 days; in the traumatic cases without tear sac disease the shortest was 7 days, the longest 41 days; average 19.4 days. In the so-called spontaneous cases, 4 to 57 days, makes an average of 23 days. This time at the hospital might often have been shorter; yet, since we considered the impossibility of their taking care of themselves after discharge and since some of the patients were decrepit and deaf, we thought it best that they were not taken home too soon.

Furthermore, in the severest and totally neglected cases iris incarceration and prolapse had rapidly resulted, or hæmorrhages with secondary glaucoma and staphyloma formation, which often necessitated operative interference.

In general I worked, not to get at any price favorable statistics, and to this end to publish only such cases which had a fortunate ending, but to get by means of all cases at a true view concerning the definite value of this method.

In 4 cases of serpinginous ulcer (out of 9) an excellent result was obtained with V.=3/5 to 3/36; in 3 good results with V.= 3/5 to fingers at 2 meters; in one case a good result, but V.= only fingers at 2 meters. In 1 case only absolutely no success was reached.

In 19 cases of traumatic ulcer without lacrimal disease, 12 had a very good result with V.=3/5 to 3/20, 2 good with V.=3/24, and 2 slight with light perception and projection. In 1 case there was no success.

Among the 25 cases of so-called spontaneous corneal ulcers the result was excellent in 16 cases, V. normal to 3/30; good in 4 with V.=3/10 to 3/20; in 4 moderate, V.=3/24; and 1 no success.

From the favorable experiences in the typical ulcerative processes of the cornea it was thought well to try this method, also, in other forms of corneal ulceration. In 3 cases of vascular keratitic bands the result was excellent, in 1 case but moderate; with a case of large phlyctænule of the cornea the result was brilliant, all symptoms disappearing rapidly; with a large

scrophulous corneal ulcer, too (V.=1); in another case only moderate success, as in a case of herpes zoster ulcer.

Thus in 36 out of 60 hospital cases the result was excellent, in 10 satisfactory, in 3 barely so, in 8 moderate, and in 3 cases the remedy failed altogether.

As regards the sometimes very poor vision in the most favorable cases we must not forget that later on, as is usual in such cases, it will probably have improved further; moreover quite a number of cases did not come for treatment before considerable destruction of tissue, especially in the centre of the cornea, had taken place. Therefore, even with the promptest cessation of the suppurative process and a quick cleansing of the ulcer, the destroyed parts of the cornea could not be restored.

Following the recommendations by Morgenroth and Ginsburg, also, Kaufmann, most recently Professor H. Sattler, experimented at the Leipzig University Eye Clinic with æthylhydrocuprein, an apparently excellent abortive remedy for infectious corneal processes. These experiments were published by Goldschmidt (*Klin. Mtsbl.*, XVI., October-November, 1913).

Although the results obtained with this remedy must simply be called unique and thus far unapproached, and will probably remain superior to those with Epéron's remedy even in the most carefully selected cases, I think I have good reason to point out this remedy, which sometimes acts excellently, the more so since it is within easy reach of the general practitioner (who may be far from any eye specialist) and is certainly worth trying. (Lately one of my friends, a colleague practicing in the country, Dr. F. Gassmayer, reported to me that he saw a case of severest hypopyon keratitis; the patient absolutely refused to go to a hospital. Although dispairing of controlling the disease, he, having heard me speak of Epéron's remedy, applied it and was perfectly dumbfounded, as well as his patient, at the perfect success obtained.)

A further advantage of this remedy is certainly that when compared with the galvano-cautery the resulting scars are more delicate, smaller and more transparent, which is of the highest importance for vision.

It might, perhaps, be worth while to search for the bacterial irritant in every case which might furnish definite indications for certain microbes, just as an exquisite action of æthylhydrocuprein on the pneumococcus was found at Sattler's clinic.

The series of bacteriological examinations in our cases is too small to allow of such conclusions.

Aside from the hospital cases we, also, treated quite a large number of ambulatory ones, yet, since they often appeared only once an exact and useful control of the result is excluded, the more so since inquiry by letter has usually remained unanswered or was not sufficiently clear.

That Epéron's method, although no panacæa, does in fact give good service, I was pleased to see in the report of the last meeting of the "Deutsche Naturforscher and Aerzte," at which Professor Dimmer, of Vienna, during the discussion of a paper by Dr. L. Mueller, who recommended balsam of Peru, detailed his experiences with Epéron's remedy and was kind enough to write to me about his favorable results.

I might, further, mention here, that encouraged by our results in keratitis we tried the remedy also in several cases of severe conjunctival affections, especially in some cases of severe trachoma, some with keratitis pannosa, to see whether these, too, might be favorably influenced by the 20 per cent. zinc solution. Just in these severest cases the success of an energetic touching of the everted lids, followed by ablution with an indifferent fluid, was excellent. After half an hour of moderate burning the eyes became perfectly quiet. Even intense pannus yielded to it (with atropin instillations) in two cases quite rapidly.

Of course, nothing is farther from me than to draw any conclusions from these few cases.

MEDICAL SOCIETIES

PHILADELPHIA POLYCLINIC OPHTHALMIC SOCIETY.

November 13, 1913.

Symposium on Glaucoma.

Pathogenesis of Glaucoma.—Dr. William Zentmayer.

The factors in intraocular tension are the fluids of the eyes, the nerves controlling the secretion of these fluids, the channels of excretion. The fluids are the blood, the perivascular and the tissues of the lymph spaces, the aqueous and the vitreous. The channels of excretion are the spaces of Fontana, the ligamentum pectinatum, Schlemm's canal, the lymph spaces at the pole of the eye and the veins. Notwithstanding so many factors entering into it, the intraocular tension remains fairly constant under variations in these factors. So that increase in the secretion of the fluids cannot be considered an important factor in glaucoma. The cilliary body and the anterior surface of the iris are concerned in the secretion of the aqueous. The results of pathologic changes in these structures and experimental study has made this quite certain. Changes may occur in the chemical composition of the aqueous and vitreous which retard filtration. Changes occur in the angle of the anterior chamber and also in the other channels of excretion which hinder the outflow. Some of these are: enlargement of the lens with age, and sclerosis of the vessels and of the sclerotic coat. Inflammation of the sympathetic nerve may be a factor in the production of glaucoma as irritation of the nerve produces much the same symptoms which accompany glaucoma, and the division of the nerve produces the opposite conditions.

Certain ætiologic factors contribute to the pathogenesis of glaucoma. Age in the production of sclerosis of the tissues and enlargement of the lens; hyperopia in its association with the smallness of the cornea and relatively too large a lens, also in its resulting hypertrophy of the ciliary body from excessive accommodative act; grief and shock in dilating the pupil and altering secretion. Dr. Zentmayer then spoke of certain theories put forward to explain glaucoma which are based upon facts which

should be considered as factors in the production of increased tension. Such as those of Fricker and Gilbert in which the cardiovascular and vaso-motor systems are considered the prime factors, that of Fischer who ascribes it to a swelling of colloidal substances in the eye due to absorption of water, and lastly to the recent work of Strokonsky who places the entire trouble in the sclera. Aside from the senile changes which contribute to simple glaucoma, he assumes the existence of an indurative scleritis, which may be general or limited to the anterior or posterior segment. There is no increase in tension in simple glaucoma, but there is a reduction in the size of the globe with a reduction in the size of the scleral opening and an extension of the inflammation to the lamina (part of the sclera) which increases its bulk. These two factors cause the lamina to become cupped. The conditions induced by the scleritis favor the production of acute glaucoma.

In the absence of Dr. Posey, who was to speak on the *Use of Miotics in the Treatment of Simple Glaucoma,* the following views were set forth:

In the presence of chronic simple non-inflammatory glaucoma (as determined by the vision, the tension with the tonometer, the ophthalmoscopic picture and the visual fields), miotic treatment at times preserves perfectly useful vision to the patient for many years. By this is meant sufficient strength in the miotic to keep the pupils well contracted. From time to time it will become necessary to increase the strength of the miotic solution. The custom is to employ pilocarpin during the day (anywhere from ½ to 5 grs. to the oz), and eserin at bed time (anywhere from ½ to 3 grs. to the oz.). These solutions should be frequently prepared, filtered and dispensed in amber or blue bottles at least once in two weeks, and great care should be taken to wash the dropper after each instillation. Impure or contaminated solutions are likely to set up a conjunctivitis, necessitating a withdrawal of the miotic solution for a time.

In this way vision of 5/15 and over has been preserved to many patients for from 10 to 15 years, most of these being elderly people. Naturally the best results are obtained from this method in private practice where full co-operation is secured. In dispensary patients operation would therefore be generally indicated as also in young adults with chronic non-inflammatory glaucoma, say between 20 and 40 years of age.

Dr. Zentmayer and Dr. Reber agreed that this represented substantially Dr. Posey's views as to the value of miotics and the treatment of non-inflammatory glaucoma.

The Operative treatment of Glaucoma.—Dr. Wendell Reber.

In the present day operative treatment of glaucoma you have your choice of the classic iridectomy of von Graefe, of an anterior sclerotomy, a posterior sclerotomy, or one of the newer filtration operations, such as the Herbert operation, the Heine operation (cyclo-dialysis), La Grange's operation or Elliot's operation.

The arguments for iridectomy are, ease and quickness of performance (in skillful hands), rapid healing, lessened liability to infection, usually freedom from complications in the healing and 50 years records of good results in the majority of cases.

The arguments against iridectomy are, the difficulty of the corneal section in the presence of a very shallow anterior chamber, the large extent of the incision (in some cases as much as 8 to 10 mm. in length), the danger of dislocation of the lens following sudden escape of the aqueous, the likelihood of presentation of the lens in the wound and vitreous escape. These 3 factors (large opening in the cornea, forward dislocation of the lens and vitreous escape) all favor hæmorrhage into the vitreous body because of the sudden release of the support which the intraocular vessels had enjoyed up to the time the eye was opened. The greatest argument against iridectomy, however, obtains in chronic, non-inflammatory glaucoma, in which the percentage of cures and improvements after iridectomy is not large enough to justify a conscientious surgeon in urging the operation upon a patient. It was for this latter class of cases in which the vascular coat of the eye is notably degenerative, that sclerotomy was first proposed. It, also, was found insufficient because of too rapid closure of the lips of the two wounds. Herbert, therefore, after making his puncture and counter-puncture, as in ordinary sclerotomy, revolved his narrow Graefe knife in his fingers, thus making a jagged wound at the points of puncture and counter-puncture. To this he added a conjunctival bridge, and later modified it as his "Isolation-Wedge Operation".

With the same idea in view, La Grange began his incision like an anterior sclerotomy and carrying his knife up and through the sclera and conjunctiva, made a small scleral flap which was then turned forward. He then boldly cut off a piece of the sclera.

To La Grange will everlastingly belong the credit of being the first man with the courage to thus deliberately cut out a piece of the sclera.

Unfortunately La Grange's operation also creates a large opening in the cornea and it was while mulling these things over in mind, that Elliot conceived the idea of trephining a small opening in the sclera at the uppermost portion of the angle of the anterior chamber. To me it seems that this is the best filtration operation thus far devised; it not only permanently reduces tension but does so without endangering the lens and without favoring hæmorrhages into the vitreous body, as does La Grange's operation or the classic iridectomy of von Graefe. It is not quite as easily or as quickly performed as iridectomy but it should be done on an ordinary patient in from 10 to 15 minutes.

Moreover, in the vast majority of cases, it can be done under local anæsthesia and this is no small matter. It is easier of accomplishment under local anæsthesia if a preliminary hypodermic injection of morphia grs. ¼, and atropia grs. 1/150, has been employed. At first I employed it solely for the relief of pain in sightless eyes with absolute glaucoma, which it was formerly taught should be enucleated. Later I employed it in chronic simple glaucoma, and was so much pleased with the results that I have also resorted to it in acute inflammatory glaucoma. I am now of the conviction that it is equally applicable to any and all forms and phases of glaucoma.

Up to date I have made 27 Elliot operations. In two there occurred choroidal hæmorrhages, but both of these were the subject of absolute glaucoma and I have the satisfaction of feeling that I did not have to do with the disastrous consequences that attend expulsive choroidal hæmorrhage after iridectomy.

As to technique, I agree with Dr. McReynolds, of Dallas, Texas, in the use of the wedge-shaped small sharp cutting instrument for separating the conjunctival layer of the cornea when the limbus has been reached. This procedure ought to shorten the operation by at least 5 minutes and in my opinion will ensure tapping of the anterior chamber in the vast majority of cases.

Finally, I feel that Elliot's operation for glaucoma is the safest one in the hands of the operator of small experience and if this be true it ought logically to follow that it is easily the safest operation in the hands of the skilled surgeon. Those who by years of experience are absolutely committed to iridectomy as the

sheet anchor of treatment in glaucoma point to 50 years of results from this measure. I am far from denying the great boon which iridectomy has been to humanity, but I am strongly of the opinion that 25 years hence the trephining operation for glaucoma will have absolutely justified itself.

Dr. William M. Sweet drew attention to the acute cases of glaucoma that come on in the middle of the night and in many of which there are premonitory symptoms before retiring, such as pain and discomfort in and about the eyes, accompanied with the halo phænomenon. It was his feeling that an iridectomy under general anæsthesia with the keratome was the procedure of election at this time in this class of cases. If the case could be seen after the very acute stage had passed, he would rather favor trephining. He also alluded to glaucoma seen after cataract operation and graphically pictured the differential diagnosis.

Patients with chronic simple glaucoma generally appear in ophthalmologists' offices with one eye pretty badly used up as to vision and the other with beginning failure of vision. He would favor the miotic treatment in these cases tentatively, bearing in mind all the time that they may develop acute congestive glaucoma at any moment. In his opinion it would be poor surgical judgment to operate on both eyes at the same time. He would prefer to operate on one eye and wait at least an hour or two before operating on the other. In this way any tendency to disastrous choroidal hæmorrhage could be watched and properly met.

He spoke at some length of the filtration cicatrix and observed trenchantly that he was not at all alarmed by the presence of iris in the wound so long as it was covered with conjunctiva.

DISCUSSION.

Dr. Zentmayer: I have often stated my position as to the indications for the employment of miotics and operations in the treatment of simple glaucoma and have nothing to add to it at this time. As to the trephining operation I do not see how we can pass judgment on an operation so recently perfected when employed in the treatment of a disease with so chronic a course as simple glaucoma. I doubt not that at the end of a similar period of time after the introduction of iridectomy it stood as well as does trephining to-day.

I do not think anything is lost by using strong miotics frequently repeated for a period of 48 hours before performing

iridectomy in acute glaucoma. The best time to operate is in the prodromal stage before the occurrence of the first congestive attack.

Cyclodialysis is a useful substitute for enucleation in absolute glaucoma, and it is the operation of choice in glaucoma secondary to thrombosis of the central vein or marked angiosclerosis. The slow reduction of the tension after the operation is its valuable feature in these conditions.

ROYAL SOCIETY OF MEDICINE.

Section of Ophthalmology.

The ordinary meeting of the Section was held on Wednesday, December 3rd, under the presidency of Sir Anderson Critchett, Bart., C.V.O.

Mr. Cole Marshall showed a case of staphyloma posticum verum, Mr. Leslie Paton two cases of rodent ulcer treated with CO_2, Mr. Macnab a case of infiltration in and around the iris, and Mr. Grimsdale a case of microphthalmos. Mr. Herbert Parsons showed specimens of experimental glasses prepared by Sir William Crookes, O.M., P.R.S. They were synthetically prepared glasses. Sir William Crookes had two soda fluxes made by Messrs. Powell, and added to these specimens of flux, certain metals in definite proportions. He then made the glasses in small quantity, cut slices, polished them, and investigated their properties in reference to transmission of heat, and he had taken photographs of the absorption of ultra-violet rays with a quartz spectograph to test their transmission of luminous rays, and estimated their color with the tintometer. In order to test with the greatest possible delicacy, Sir William invented an exceedingly delicate instrument named the radiometer balance. He made a glass which cut off 96 per cent. of the heat. The subject was of much wider importance and applicability than the research seemed at first to show.

Dr. Morrison Legge, of the Home Office, spoke at considerable length on the subject. He said glass-worker's cataract was brought to his notice as a member of the Departmental Committee which sat to enquire into the question of compensation for industrial diseases, in 1906; and much valuable information was forthcoming from a very intelligent Secretary of a glass-

workers' association. The late Mr. Simeon Snell set himself to collect information on the subject, but his method was not calculated to yield the truest results, for he circularized the manufacturers themselves, asking how many cases of cataract they had known among their workers. As a result, Mr. Snell came to the conclusion that cataract was not specially prevalent among glass-workers. A systematic examination of workers for the condition might result in men having the condition being discharged, whereas it took ten to twelve years to prove disabling. He, Dr. Legge, went himself into the glass factories of St. Helens and Sunderland, and he was very much impressed by the number of men who came up showing this cortical cataract, varying in size from a pin's head to what looked like a large blot of ink in the centre of the pupil; it was quite different from the striæ from the periphery in senile cataract. He was struck by the small degree to which the eyesight of the patients suffered. In only very few cases were there opacities in the cornea.

The president, in thanking Dr. Legge for attending and making his valuable contribution, said that in Italian glass works the workers were much nearer the flame, and it was very rare indeed to find a worker of forty years of age whose cornea was not affected.

Mr. N. Bishop Harman read a contribution, and showed photographs, on an operation to improve the effect of an artificial eye. His object was to render the loss of an eye less conspicuous. He remarked that, other things being equal, the effectiveness of the disguise was controlled by the shape of the palpebral fissure. With a small fissure, the shell was effective: with a wide and generous form of fissure the shell provided insufficient support, so that the lids dropped away, deep sulci marked the lids, and the shell was exposed in its naked bareness. The operation aimed at doing for the large-eyed what the small-eyed had by nature. The lids were secured in a clamp devised for the purpose, then split at the inter-marginal space, and the raw surfaces brought together so as to shorten the fissure. The lid surfaces were protected from scarring by the suture, by rubber guards that also afforded elastic pressure. On the fourth day the suture was removed and any adjustment of an excessive effect could be made. The effect of the narrowing of the fissure was to draw forward the lids, slightly cover the shell, and shadow it, so that in place of the fixed stare there was a slight and subtle wink. The pull of the lids against each other tended to smooth

out the deep sulci above and below; the relative movement of the shell was also improved. The effect was to make the beholder of the face concentrate on the natural eye, which became the fixative feature of the face. In the words of an early poet, it became a face "with one auspicious and one drooping eye": the slightly winking, drooping eye was a companion inconspicuous by reason of its lesser character.

Mr. W. M. Beaumont read a paper on Iritis, rheumatic and toxæmic. He said doubts had been thrown upon the existence of a rheumatic form of iritis, and modern views of the nature of rheumatism seemed to coincide with those doubts. The author, earlier, had been a sceptic, and his views had found expression on several occasions in the columns of the *British Medical Journal*. Poynton's and Paine's invaluable researches, based on bacterial experiment, had stimulated interest, whilst the papers read at the annual meeting of the British Medical Association and at the International Medical Congress brought the subject again to the front. A difficulty arose in Poyton's and Paine's results, because iritis associated with acute rheumatism was so extremely rare that it might be considered negligible; whereas these investigators had been able, on at least two occasions, to produce iritis by the intravenous injection of the products of rheumatic infection into rabbits. A negation of rheumatic iritis seemed to be a natural corollary of the "passing" of rheumatism, and it seemed to the author that their experiments almost proved too much. He thought that a more extended view of the frequency of toxæmia, and especially of gonorrhœa, as a cause of iritis, would be the outcome of further research. But as, in the past, it had been usual to parcel out the different causes of iritis, without including toxæmia as one of them, it was clear that if that factor were generally accepted, it must very considerably reduce the percentage of some of the fully recognized causes. He thought that the class that would be materially reduced would be the nondescript one "rheumatic."

The paper was discussed by Mr. Lawford, Mr. Herbert Fisher, Mr. Cobbledick, Mr. Mayou, Dr. Thompson, and the President, and the author replied.

BERLIN OPHTHALMOLOGICAL SOCIETY.

Meeting October 23rd, 1913.

Report By Dr. Curt Adam.

Abnormal Pigmentation of the Sclera and Fragilitas Ossium.—Adam.

Adam exhibited two cases of this association; the first was in a man of 30 who had fractured a finger twice, a foot and an arm. A brother, with blue sclerotics, had had ten fractures, but other members of the family were normal both in bones and in pigmentation. The second case was that of a boy of 14 who had suffered from fracture four times from quite "insufficient" injuries; for example, he sustained a fracture of the humerus as the result of a blow with a fist, and his astragalus was broken by another boy of 15 treading upon his foot.

Neither of Adam's patients showed any other sign of degeneration.

Vascular Tumour of the Retina.—Ginsburg.

On behalf of Spiro, Ginsberg exhibited a boy of 14 in whom the history and appearances were interesting, for in May, 1905, he had undergone careful examination and nothing abnormal was detected, but in January, 1906, he first complained of fluttering before the left eye. At that time slight swelling and loss of definition at the temporal margin of the left disc were established, and the blind spot was enlarged. There were no indications of any general constitutional vice. In the right eye there was a rose-tinted mass, about one-half the size of the disc and about 5 D.D. below it; this was partly superficial to the retinal vessels but partly lay deeper. The aspect of the right eye had remained unchanged, but in the left the swelling of the papilla had increased, quickly at first, more slowly later, till a swelling occupied the nerve head and gradually developed into a growth three disc-diameters in width and 4 D. in height. In 1908 detachment of retina came on; this was followed by attacks of glaucoma in 1910, necessitating enucleation in 1912. It was found on opening the eye that there was a complete detachment of retina, and a small tumor ($2\frac{1}{2}$ mm.$\times 1\frac{5}{8}$ mm.) was discovered in the temporal portion of the retina with numerous vessels and many-celled glial tissue. Microscopically, glial tissue containing tortuous fibres and numerous cells, including giant cells, were demonstrated, with proliferation of the endothelium. The walls of the larger vessels were everywhere invaded by degenerative changes in the endothelium besides the presence of other

changes of a less definite type. Sections which included the optic nerve showed overgrowth of glia particularly, reaching out to the neoplasm, which was permeated by a network of fine blood-vessels, whose lining was partly in a degenerated and fatty state. In the remainder of the retina, but more especially in a second smaller nodule there, which was embedded in the retina, were the ordinary changes incident to detachment. Each of the little tumors was well defined at that margin which was directed towards the layer of large cells, but decidedly less so towards the internal plexiform layer. In the larger of the two tumors were found, then, overgrowth of the vessels and the cells of the adventitia, and overgrowth further of the supporting tissue which was permeated by numerous ill-defined vessels. In short, the tumor was an angioglioma with only local malignancy. The multiplicity of the tumor and the affection of both eyes bring the case into relation with the angiomatosis of Goldbieher, Czermak, and von Hippel, which, however, it does not resemble in respect of the absence of distension of the actual vessels: whether this difference be sufficient to distinguish it from the other type cannot yet be decided. The relatively great development of the connective tissue in the present case prevented the nodules from possessing the blood-red appearance which has previously been described. Some of the authors have regarded this glia-formation as primary, others as an indication rather of tissue reaction, others again, hold that the copious vessel formation has in reality little real importance. In the discussion which followed the exhibition of the case Krückmann endeavored to draw a distinction between true tumor formation (glioma) on the one hand, and hyperplasia (gliosis with copious formation of new vessels), on the other.

Elliot's Operation (Trephining the Sclerotic).—Paderstein.

To make certain of reaching the anterior chamber, Paderstein advocates holding the trephine somewhat obliquely; he employs one with a fine "stop," so fine that it does not interfere with one's view, in order to avoid plunging suddenly through the tissues. In the course of the discussion, Hirschberg expressed the view that in acute glaucoma, iridectomy was greatly to be preferred to trephining, while Krückmann does not operate at all in chronic glaucoma in which there are no exacerbations. He agreed with Hirschberg that in acute glaucoma the operation of choice is iridectomy, but when the tension is excessive and the anterior chamber extremely shallow, trephining might perhaps be useful preliminary procedure.